

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

- 1-24 (Canceled)
25. (New) A flexible polyurethane foam obtained by reaction between a polyesterpolyol and a diisocyanate, having a density, determined according to ASTM standard D3574(A), of less than 0.3 g/cm^3 , a hardness, measured according to NBR standard 14455 (Ascher C), of greater than or equal to 45 and a compression set, determined according to ASTM standard D 395 (B), of less than or equal to 12%.
26. (New) The foam according to Claim 25, wherein the density is between 0.1 g/cm^3 and 0.25 g/cm^3 , optionally between 0.15 g/cm^3 and 0.23 g/cm^3 .
27. (New) The foam according to Claim 25, having a tear strength, measured according to ASTM standard D 3574 (F), of greater than or equal to 2.5 kg/cm .
28. (New) The foam according to Claim 25, having a tensile breaking stress, measured according to ASTM standard D 412, of greater than or equal to 18 kg/cm^2 .
29. (New) The foam according to Claim 25, having an elongation at break, measured according to ASTM standard D 412 (C), of greater than or equal to 250%.
30. (New) The foam according to Claim 25, having a moulding shrinkage,

determined according to SATRA standard TM 70, of less than or equal to 1.0%.

31. (New) The foam according to Claim 25, further containing a dispersed mineral particulate filler in a weight concentration of between 0.8% and 8% relative to the total weight of the foam.
32. (New) The foam according to Claim 31, wherein the mineral filler particles have a mean size of less than 60 μm .
33. (New) The foam according to Claim 32, wherein the particles have a mean size of less than 20 μm , optionally less than 10 μm .
34. (New) The foam according to Claim 31, wherein the mineral filler is aluminosilicate, silica, titanium oxide, talc, calcium carbonate, mica or kaolin.
35. (New) The foam according to Claim 34, wherein the mineral filler is a precipitation silica.
36. (New) The foam according to Claim 25, wherein the polyesterpolyol is obtained by reaction between a diol and a diacid or a mixture of diacids comprising at least adipic acid and at least one diacid having 5 carbon atoms or less.
37. (New) The foam according to Claim 36, wherein the diacid having less than 5 carbon atoms is glutaric acid.
38. (New) A reactive extrusion process for manufacturing polyurethane foam as defined in Claim 31, comprising the steps of: feeding in a diisocyanate compound, a composition formed by a suspension of mineral fillers in a

polyesterdiol, a catalyst and a foam-forming agent, the said foam-forming agent being present in an amount required to obtain the desired density.

39. (New) The process according to Claim 38, wherein the composition formed by a suspension of mineral fillers in a polyesterdiol is obtained by reacting a diol compound with at least one diacid in an esterification step, followed by a polycondensation until the desired degree of polymerization is obtained, the diacid being adipic acid, and wherein the mineral filler is dispersed in or fed into the reaction medium either before the esterification step or at the start of the polymerization step.
40. (New) The process according to Claim 39, wherein the diacid is a mixture of adipic acid and of diacids having 5 carbon atoms or less.
41. (New) The process according to Claim 40, wherein the diacid is a mixture of adipic acid, glutaric acid and succinic acid.
42. (New) The process according to Claim 39, wherein the diacid is a mixture of adipic acid and AGS.
43. (New) The process according to Claim 42, wherein the adipic acid is present in the acid mixture in a concentration of between 2% and 20% by weight.
44. (New) The process according to Claim 39, wherein the mineral filler is added to the esterification medium as a mixture with at least some of the diacids.
45. (New) A shoe midsole obtained by moulding a polyurethane foam as defined in Claim 31.

46. (New) The shoe comprising at least a portion of the sole as defined in Claim

45.